presented by the substance even when in very thin plates. Besides this, contrary to what is found in Harmotome, while the dispersion belonging to the optic axes is very distinct, the *horizontal and twisted* dispersions, which should be sought for in plates normal to the two bisectrices, are, on the contrary, but slightly evident. However, on examining in oil some thin plates placed so as to have the plane of their optic axes horizontal and perpendicular to the plane of polarization, the author observed in the plates normal to the obtuse, *positive* bisectrix, some faint blue and red fringes, dispersed in contrary directions above and below the bars which traverse the two systems of rings, indicating the existence of an appreciable *twisted* dispersion. In the plates normal to the acute, *negative* bisectrix, the transverse bar of each system is bordered on one side by a very pale blue, and on the opposite side by an equally pale yellow, the horizontal dispersion being thus feebly indicated.

The crystals of Wöhlerite ought, then, to be referred to an oblique rhombic prism, in which the plane of symmetry is normal to the plane which contains their optic axes. The primitive form which it seems most convenient to choose is a prism with an angle of very nearly 90°, which presents a cleavage, easy though interrupted, parallel to its plane of symmetry, and cleavages which are more difficult in the directions of the lateral faces m and of the plane h' which is parallel to the horizontal diagonals of the base.

The author then describes in detail the crystalline form of Wöhlerite as thus corrected.

III. "On the Law of the Resistance of the Air to Rifled Projectiles." By Charles W. Merrifield, F.R.S., Principal of the Royal School of Naval Architecture. Received March 19, 1868.

(Abstract.)

At the beginning of this month Lieut.-Col. H. R. Halford applied to the author to obtain for him the law of atmospheric resistance resulting from his experiments in shooting with Metford's match-rifle, a small bore with increasing pitch. Col. Halford had determined by experiment the elevations required for the ranges 100, 200, &c. up to 1100 yards, each determination being derived from a very large number of shots; and the table of experimental elevations, corresponding to these various ranges, formed the datum furnished to the author.

As all the trajectories were very low, the greatest elevation amounting to only 2° 35′ 30″, the author assumed, as a sufficiently close approximation, that the vertical motion was determined solely by the force of gravity, and that the effect of the resistance of the air on the velocity was the same as if the projectile had moved strictly in a horizontal line. Consequently the depression of the point in which the target is struck, below the initial

tangent to the path, becomes a measure of the time of flight, according to the usual law of falling bodies; and the mean horizontal velocity being thus known for a series of different ranges, we can calculate the mean velocity for every 100 yards of a long range, and thence determine the resistance.

The author commenced his calculations from an assumed velocity of 1360 feet per second, in accordance with the results obtained at short ranges, and assumed for trial a resistance varying as the square of the velocity, but found that this law did not fit the results at all. A resistance varying as the cube of the velocity was then tried, and found very nearly to agree with the results of observation; and the agreement became, we may say, perfect, when the assumed initial velocity was slightly corrected.

As the calculations and experiments were all made without any notion of the resulting law, and without any knowledge of the work already done by Professor Hélie and Professor Bashforth, they afford a remarkable confirmation of the results obtained by those gentlemen. This is the more worthy of notice, as their data belong to pieces of large calibre, and the author's to small arms.

IV. "Remarks on the Great Nebula in Orion." In a Letter addressed to Prof. G. G. Stokes, Sec. R.S. By W. Lassell, F.R.S. Received February 28, 1868.

I have been so much interested by the perusal of Lord Oxmantown's observations and drawing of the Great Nebula in Orion, published in the present volume of the 'Transactions,' that I venture to offer you a few remarks upon them—the more readily, as I may be supposed to be somewhat familiar with that object, though observed with less advantage of optical power.

On comparing the present drawing with my own, made with the four-feet equatorial during my late sojourn at Malta, I find that of the 93 new stars in Lord Oxmantown's list, there are, I believe, only 24 within the more limited area of my drawing. A good many of these have escaped my notice, while, on the other hand, I have detected several which I do not find in the present Catalogue. The following are instances of a few:—Three stars north-preceding No. 119; four stars about the hypothenuse of the nearly right-angled triangle formed by the stars 47, 52, and 53; two stars in the triangle formed by 30, 32, and 35; a delicate point about 20″ from 104, with several others. Some of these I have so repeatedly and certainly seen, that I wonder not to find them here. The explanation of this discrepancy may possibly in some instances be found in variability, but must, I think, be rather sought for in the influence which the state of atmosphere has on such delicate objects, when the highest combinations of light and power are brought to bear upon them. As this is a nebula of